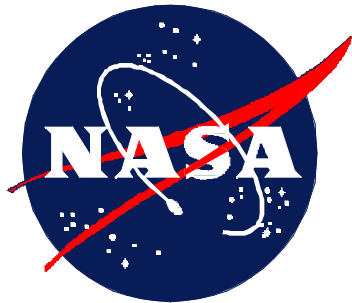


**470-PLAN-0003**

# **Earth Explorers Program Flight and Ground Safety Requirements**

**March 2001**



National Aeronautics and  
Space Administration

---

Goddard Space Flight Center  
Greenbelt, Maryland

---

# **Earth Explorers Program**

## **Flight and Ground**

## **Safety Requirements**

**March 2001**

**Goddard Space Flight Center**  
**Greenbelt, Maryland**

## EARTH EXPLORERS PROGRAM

### Flight and Ground Safety Requirements

Reviewed by:

*Signed By David Cissell*

David Cissell  
Systems Assurance Manager  
GSFC – Code 303.0

*4/20/2001*

Date

Approved by:

*Signed By Nicholas Chrissotimos*

Nicholas Chrissotimos  
Earth Explorers Program Manager  
GSFC – Code 470

*4/20/2001*

Date

GREENBELT, MARYLAND

# CHANGE RECORD PAGE

[illegible]

**DOCUMENT TITLE:**

**RELEASE DATE:**

Original

iii

March 2001

Original

## Table of Contents

### **1.0 Overview**

1.1 Purpose.....	1-1
------------------	-----

### **2.0 Flight Systems**

2.1 Flight Systems (Hardware & Software).....	2-1
---	-----

### **3.0 Documentation**

3.1. Top Level Safety Requirements Documentation.....	3-1
---	-----

### **4.0 MISHAP REPORTING AND INVESTIGATING**

4.1. Mishap Reporting and Investigating Policy.....	4-1
4.2. Actions To Be Taken .....	4-1



## **PREFACE**

The purpose of this document is to serve as a resource to the Project/Mission Team of each Earth Explorers project/mission for complying with necessary NASA safety requirements.

## **1.0 Overview**

---

### **1.1 PURPOSE**

All Mission/Project Teams shall establish, implement and maintain a system safety program in accordance with the following requirements:

- Identifies and controls hazards to personnel, facilities, support equipment, and the flight system during all stages of mission/project development. The safety program shall address hazards in the flight hardware, associated software, ground support equipment, and support facilities.
- Meets the system safety requirements stated in the applicable launch site safety regulation.
- Meets the baseline industrial safety requirements of each mission/project team member's institution, as well as any special contractually imposed mission/project unique obligations.
- Meets NASA and GSFC safety requirements.

The safety program shall be documented in a Safety Plan for each Mission/Project, and shall apply to all work performed by the Mission/Project, its subcontractors and suppliers, and Mission Team members.

## **2.0 Flight Systems**

---

### **2.1 FLIGHT SYSTEMS (Hardware & Software)**

Flight hardware and software systems developers shall implement a system safety program in accordance with the requirements imposed by the appropriate launch range and the launch vehicle manufacturer or launch service provider. The requirements are mandatory and are not negotiable, but may be tailored to the extent that not all requirements apply to every project/mission. The tailoring of the requirements to the specific mission is done with the applicable launch range safety organization.

Each project/mission shall comply with the “NASA Policy for Limiting Debris Generation” (NPD 8710.3) and the NASA Safety Standard “Guidelines and Assessment Procedure for Limiting Orbital Debris” (NSS 1740.14). Each Project/Mission Team shall be responsible for performance of the required orbital debris assessment.

Each project or mission shall also comply with the National Environmental Policy Act (NEPA) in accordance with NASA Regulations (14 CFR, Part 1216, Subpart 1216.3). This requires that environmental impacts be considered in project planning and decision making. Each Project/Mission Team shall contact the Safety and Environmental Branch, NEPA Coordinator at GSFC, early in the project development. An environmental evaluation or preliminary review shall be performed to determine the appropriate level of NEPA review/documentation (Categorical Exclusion (CATEX), Environmental Assessment (EA), or Environmental Impact Statement (EIS)).

The following are mandatory compliance requirements for hardware and software intended to be launched on any of the various launch vehicles/launch services. The Mission/Project Team ensures compliance with the requirements and certifies to the launch range, in the form of the Safety Data Package, that all of the requirements have been met.

The following documents describe the complete safety program implementation and deliverables required to safely launch space hardware. The documents reference other requirements that the flight system developer must also meet to gain access to the launch site and subsequent launch.

---

### 3.0 Documentation

---

#### 3.1 TOP LEVEL SAFETY REQUIREMENTS DOCUMENTS

Any payload (ELV or Shuttle) using Kennedy Space Center (KSC) facilities for testing, integration, etc. (including those at Eastern Test Range (ETR) and Western Test Range (WTR) where KSC has jurisdiction for reviewing procedures and facilities) shall comply with KHB 1710.2C, "Kennedy Space Center Safety Practices Handbook".

**For Shuttle Missions:**

- 1) NSTS 1700.7B, "Safety Policy and Requirements for Payloads Using the Space Transportation System".
- 2) 45 SPW S-100/KHB 1700.7B, "Space Shuttle Payload Ground Safety Handbook"

**For ELV Missions at ETR or WTR:**

EWR 127-1, "Eastern and Western Range Safety Requirements".

**For Wallops Flight Facility (WFF) Missions:**

RSM-93, "Range Safety Manual for Goddard Space Flight Center (GSFC)/Wallops Flight Facility (WFF)".

**For Missions Flying on the Pegasus Launch Vehicle:**

- 1) "Pegasus Design Safety Requirements Document" (SSD TD-0005) (currently Rev B).
- 2) "Pegasus Safety Requirements Document for Ground Operations" (SSD TD-0018) (currently Rev A).

## **4.0 Mishap Reporting And Investigating**

---

### **4.1 MISHAP REPORTING AND INVESTIGATING POLICY**

In accordance with NPD 8621.1G, NASA Mishap Reporting and Investigating Policy, the Earth Explorers Program will report mishaps as part of the Goddard Mishap Reporting and Investigation process. This section defines the reporting actions to be taken in response to mishaps related to Earth Explorers Program efforts.

Mishaps in this context are defined as “any unplanned occurrence or event resulting from any NASA operation, or NASA equipment anomaly, involving injury or death to persons. Damage to or loss of property or equipment, or mission failure, provided that a written agreement or contract between NASA and another party did not otherwise allocate operational control and corrective action responsibility.” Mishaps also include Close Calls. NPD 8621.1G further categorizes mishaps as Types A, B, and C; Mission Failure; Incident; and Close Call. The definitions for these types of Mishaps are available in the NDP 8621.1G document available on the NASA On-Line Directives Information System (NODIS) at [http://nodis3.gsfc.nasa.gov/library/main\\_lib.html](http://nodis3.gsfc.nasa.gov/library/main_lib.html).

Earth Explorers Program Mishaps occurring at facilities outside of GSFC will normally be reported by the facility directly with a notification of the Mishap to the Earth Explorers Program. The Earth Explorers Program will not make a duplicate report. If the facility fails to report a Mishap, however, the Mishap shall be reported in accordance with Section 4.2.

### **4.2 ACTIONS TO BE TAKEN**

Anyone who becomes aware of a Mishap shall report it.

As soon as a Mishap is identified, the Earth Explorers Program Systems Assurance Manager (SAM) should be contacted for assistance in preparing and submitting the formal report of the Mishap. The SAM will also provide assistance if anyone is unsure as to whether or not an item should be documented as a Mishap.

The Mishap shall be documented on NASA Form 1627 within 24 hours. [Note: Alternative GSFC reporting systems may be developed in the future. These may be used if they have been approved for Center use.] Copies of the NASA Form 1627 may be obtained from the SAM and are also available on the System Safety and Reliability Office, Code 302, website at <http://arioch.gsfc.nasa.gov/302/safety/1627long.doc>.

The completed NASA Form 1627 shall be submitted to the GSFC Safety, Environmental and Security Office, Code 205.2. The SAM will assist with this effort as needed.